

Claims

- [c1] What is Claimed is:
1. A method of controlling an internal combustion engine of a vehicle, the engine communicating exhaust gases to a catalyst, the method comprising:
predicting a future engine operating event that will change an exhaust gas constituent in the exhaust gases;
determining an oxygen content in exhaust gases downstream of the catalyst coupled to the engine; and,
adjusting an air-fuel ratio of the engine based on said oxygen content and said predicted engine operating event.
 - [c2] 2. The method of claim 1 wherein said future engine operating event is an increase in inducted air into the engine.
 - [c3] 3. The method of claim 2 wherein said adjusting step includes enriching said air/fuel ratio prior to said increase in inducted air.
 - [c4] 4. The method of claim 1 wherein said determining step includes measuring a signal indicative of oxygen content in exhaust gases downstream of the catalyst.
 - [c5] 5. The method of claim 1 wherein said exhaust gas constituent is NO_x.
 - [c6] 6. The method of claim 5 wherein said predicting step includes

determining that NOx concentrations in the exhaust gases will be increasing due to the future engine event and adjusting the fuel injection amount to provide fuel enrichment in response to the prediction.

[c7] 7. The method of claim 6 wherein said fuel enrichment reduces the oxidant level of the catalyst to reduce the chance of oxidant saturation in the catalyst when the impending engine event occurs.

[c8] 8. The method of claim 1 wherein said event is predicted by determining whether an engine throttle is closed and whether a vehicle speed is below a predetermined calibrated vehicle speed value.

[c9] 9. A system for controlling an internal combustion engine of a vehicle, the engine communicating exhaust gases to a catalyst, the system comprising:
an exhaust gas oxygen sensor disposed downstream of the catalyst generating a first signal, and
a controller receiving said first signal, said controller configured to predict a future engine operating event that will change an exhaust gas constituent in the exhaust gases, said controller further configured to adjust an air-fuel ratio of the engine based on the first signal and said predicted engine operating event.

- [c10] 10. The system of claim 9 wherein said future engine operating event is an increase in inducted air into the engine.
- [c11] 11. The system of claim 10 wherein said controller is further configured to enrich said air/fuel ratio prior to said increase in inducted air.
- [c12] 12. The system of claim 9 wherein said exhaust gas constituent is NO_x.
- [c13] 13. An article of manufacture, comprising:
a computer storage medium having a computer program encoded therein for controlling an internal combustion engine communicating exhaust gases to a catalyst, the computer storage medium comprising:
code for predicting a future engine operating event that will change an exhaust gas constituent in the exhaust gases;
code for determining an oxygen content in exhaust gases downstream of the catalyst coupled to the engine; and,
code for adjusting an air-fuel ratio of the engine based on said oxygen content and said predicted engine operating event.